

What is Claimed is:

- 5
1. An apparatus for high efficiency gas temperature and humidity adjustment, comprising a condensate water removal means for removing condensate water deposited on a cooling coil.
2. An apparatus for high efficiency gas temperature and humidity adjustment, comprising a means for supplying the cooling coil with deaeration water or hydrogen water as cooling water.
- 10 3. The apparatus for high efficiency gas temperature and humidity adjustment of claim 1, wherein said condensate water removal means is a means for spraying compressed gas to the cooling coil.
- 15 4. The apparatus for high efficiency gas temperature and humidity adjustment of claim 3, wherein the pressure of said compressed gas is 2 to 10 kgf/cm<sup>2</sup>.
5. The apparatus for high efficiency gas temperature and humidity adjustment of claim 3 or 4, wherein said compressed gas is a cooling gas.
- 20 6. The apparatus for high efficiency gas temperature and humidity adjustment of claim 1, wherein said condensate water removal means comes physically into contact with the condensate water, and has a function to remove said condensate water.
- 25 7. The apparatus for high efficiency gas temperature and humidity adjustment of claim 6, wherein said condensate water removal means is a brush.
- 30 8. The apparatus for high efficiency gas temperature and humidity adjustment of claim 7, wherein said brush is composed to be capable of removing said condensate water by rotation or other displacement.
- 35 9. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1 to 8, wherein cooling fins of said cooling coil are divided every one line or two lines, or have slits for displacement guide disposed every one line or two lines of heat exchange fins.
10. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1, 2 to 9, wherein the

surface of said cooling coil is composed of water-repellent surface.

5 11. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1 to 10, comprising a means capable of spraying condensed liquid again.

10 12. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1 to 9, wherein a surface treatment using alumite treatment film or the like is applied to the surface of said cooling coil so that the heat transfer efficiency from the surface thereof to the gas by heat radiation be improved.

15 13. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1 to 12, wherein an ultrasonic applying apparatus for applying vibration by ultrasonic waves is comprised on the surface of said cooling coil.

14. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1, 3 to 13, comprising a means for supplying the cooling water tube of said cooling coil with deaeration water.

20 15. The apparatus for high efficiency gas temperature and humidity adjustment of any one of claims 1, 3 to 13, comprising a means for supplying the cooling water tube of said cooling coil with hydrogen water.

25 16. A method for high efficiency gas temperature and humidity adjustment; comprising the steps of, letting flow cooling water in a cooling water tube of a cooling coil, and cooling a gas to be cooled by letting flow the gas to be cooled between cooling fins, wherein deaeration water is used as coil cooling water.